Progress Report of the
Louisiana Sea Turtle Assessment Program

Prepared by

Steven Rabalais

Louisiana Universities Marine Consortium

Chauvin, Louisiana 70344

9 May 1989

INTRODUCTION

The earliest record of sea turtles in coastal Louisiana appears in the journal of James Leander Catcart (in, Sothern, 1980) who visited Last Island in January 1819. He writes that this "is an excellent fishing place, & abounds in Turtles". At that time a small community was "establish'd on the Island to catch and fish & turtle for the New Orleans market". On this day alone they had caught 5 turtles the largest weighing 300 pounds. According to Catcart the animals were kept in a pen made with stakes and were sold for $7.00/each.

These observations provide valuable information about sea turtle stocks in coastal Louisiana before the advent of modern fishing techniques. There is no question that the turtles described here were sea turtles. The size of the animals and the area in which they were captured (Last Island is about 5 miles from the mainland and about 10 miles from large fresh water sources) indicate that at least the largest individual was an adult loggerhead or green turtle.

It can also be assumed, from his commentary, that sea turtles were relatively abundant in this area. Turtles must have been present in large numbers for so many (5) to be caught, in January, by 3 men in just one day. It is possible that cold weather during this time stranded large numbers of turtles, making them more accessible for capture. Cathcart,

however, made no mention of extremes in temperature during his stay on the Island and, in fact, complained of not being able to sleep at night because of mosquitos. If cold weather had caused mass strandings it is unlikely that the mosquitos would have survived the weather. Also, because the animals were kept in pens (alive),it could be assumed that they were alive and healthy. Finally, it is unusual for turtles, the size of those described to be stranded by cold water (Ehrhart,1977).

It is generally assumed that sea turtles are no longer as abundant anywhere in the Gulf of Mexico as they were during this time. Often, this assumption is based on very little real knowledge and no where is this more true than in coastal Louisiana. Prior to 1960 only one reference can be found that mentions sea turtles in Louisiana waters(Liner.1954). Since then a number of unpublished reports document the presence of marine turtles here but none provide conclusive evidence upon which preliminary population estimates can be based.

In 1984 we began a study to determine the status of sea turtle populations in Louisiana. Evidence presented in accounts like those of Cathcart, and from acquired knowledge of the area and it's people indicated that turtles are relatively abundant in this area. Also, the Gulf waters off Louisiana are extremely productive and could serve as major feeding grounds for species like the Kemp's ridley, which prefer blue crabs,(Dobie et.al. 1961, Pritchard and Marquez,

1973, and Hildebrand, 1981)., a dominate benthic invertebrate in this region.

We discovered through conversations with local watermen (predominantly trawl boat operators) that sea turtles were common and all of them could provide information about turtles they or friends had caught in the very recent past. (Unfortunately they could also give very detailed instructions for preparing and cooking their catch.)

On the advise of these people we went to Oyster Bayou in the summer of 1984 and began gathering information that would provide the basis for more accurate population estimates. A number of trawlers were contacted and most gave very encouraging accounts. Most had seen winged or white (we assumed this refers to the white or drab color of juvenile ridley's) turtles during their current trip and some had captured more than one in a single day. For the most part, these people were very cooperative and eager to provide information about sea turtles in this area. They were also familiar with the proper techniques for reviving drowned turtles and regularly used them on the turtles they captured.

However, the fact that they were not completely successful at resuscitating captured turtles was demonstrated when we surveyed the coast-line inshore of where the fleet was working. Numerous dried juvenile ridley carcasses were found indicating that turtles were present and were most likely being caught by trawlers, drowning and

than stranding along the irregular beach at Oyster Bayou. Because the coast along the northern edge of Caillou Bay is very erosional and in some areas covered by thick patches of marsh grass, it is difficult to find stranded turtles and therefore difficult to quantify the number of turtles stranding over a given time period. But, the presence of stranded animals along with the information gathered from the fishermen working in Caillou Bay indicated that this area was a productive habitat for turtles.

From 1985-1988 information on turtle stranding and sightings in Louisiana were recorded and forwarded to the NMFS-STSSN. During this time the entire Louisiana coast from Calcasieu Pass to the western edge of the Mississippi River Delta was surveyed by foot for stranded turtles. Regular surveys of the coast at Oyster Bayou and Last Island and Timbalier Island were conducted.

By the summer of 1987 the beach at Oyster Bayou had eroded to the point that it would be almost impossible to survey. Also, turmoil created among commercial fishermen over TED regulations restricted interactions with this group. It was therefore decided in 1988 that regular beach surveys of Oyster Bayou would be discontinued and efforts would be focused at reestablishing contacts within the fishing fleet and using commercial trawl boats to capture turtles for tagging and release. Stranding data would continue to be collected and random stranding surveys would be conducted when appropriate.

The following report is divided into two sections, one dealing with beach strandings from 1985-1988 and the other giving a detailed description of the current efforts at working with the commercial fleet.

RESULTS

Strandings

In July-August 1986 the entire coast from Calcasieu Pass to Bayou Fontelle was survey by foot. Limited portions along the central coast were surveyed again in December 1986. The coast either side of Oyster Bayou were surveyed quarterly in 1986 and 1987, and twice in 1988. Random surveys of Timbalier and Isles Dernier were also conducted during this three year period. Stranding information from these surveys along with data received from stranding network volunteers is shown in Figure 1.

A total of 230 turtles were recorded from the state from Sabine to the eastern margin of the state including the Chandeleur Islands. All areas of the state recorded a relatively consistent stranding intensity except for Area 1 in 1986.

This area includes the beaches from the eastern end of Southwest Pass to the western side of Sabine Pass. Most of

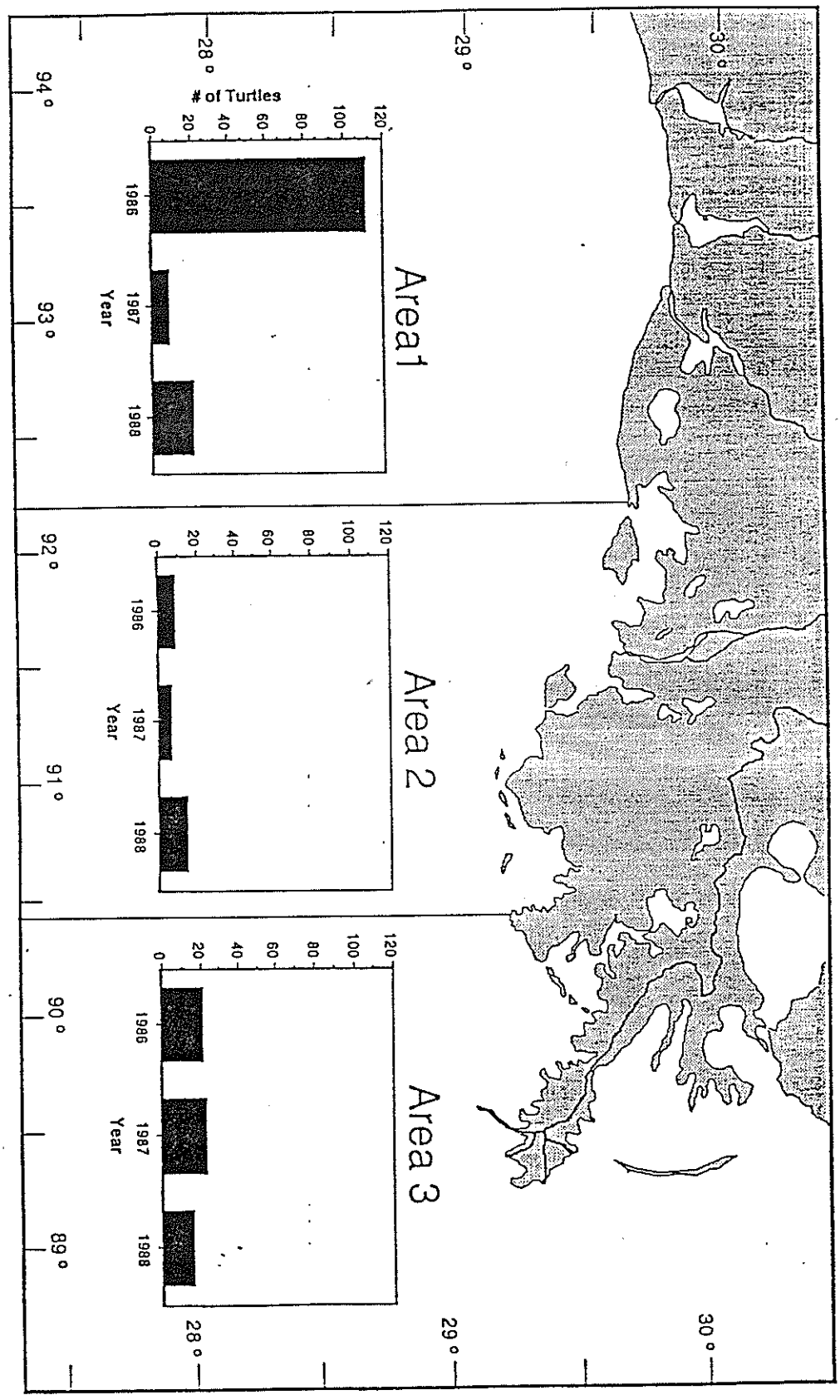

Figure 1. Total number of turtles stranded in Areas 1,2,and3 during 1986-88.

the coast line in this region is typical marsh fringe with very little open beach except for the area either side of Calcasieu Pass. Rutherford, and Broussard beaches on the east side of the Pass and Holly beach to the west are the only barrier beaches in Louisiana, other than Grand Island/Fourchon accessible by road. These beaches are inhibited year-round and experience heavy use during most of the year, which may explain the large number of strandings reported in this area.

The entire length of coast line in Area 2 is only accessible by boat and only a very small portion is barrier island beach. Consequently, animals stranding in this area are not found and reported because there is restricted human activity or they become lost in the marsh vegetation. This area of the coast is also highly erosional and barrier island beaches where they exist have a high berm which restricts the deposition of flotsam including stranded sea turtles. About 80% of the strandings from this area occurred in the eastern portions along Oyster Bayou and the Timbalier/Last Island chain

Area 3 includes the area from Bell Pass to the eastern edge of the state. Except for the beaches on Grand Isle and Chandeleur Island and at Fourchon, this area like Area 2 also experiences very little human traffic and the gulf margins are usually marsh grass. The majority of the animals stranded in this area were reported from the Grand Island and Grand Terre Island.

Sixty percent of the turtles stranding in Louisiana during the 3 year period were Kemp's ridley (Figure 2). Ridleys were the most common species stranded in all Areas with 69%, 52% and 43% from Areas 1,2, and 3 respectively. Loggerheads were the second most common species reported with their numbers increasing progressively toward the eastern portion of the state. Less than 20% of the reported strandings were Leatherbacks, Greens, Hawksbill or were unidentifiable remains of one of the 5 species already mentioned.

Capture and Release

In 1988 efforts were shifted from documenting sea turtle strandings to a field program aimed at capturing and tagging wild turtles. During 1986 and the first part of 1987, before the introduction of TED regulations, local fishermen were very cooperative and free with information about turtles in the area. Most of the fishermen questioned fished in the waters around Oyster Bayou, west to the Atchafalaya River. The average turtle catch per boat was about 6-8 turtle per year. Some watermen indicated that the bottom around Point Au Fer was especially productive.

Mr. Kieth Luke was one of the individuals who had caught turtles around Point Au Fer and Oyster Bayou and was contacted to aid in our attempts to capture and tag animals. Arrangements were made to accompany Mr. Luke aboard his

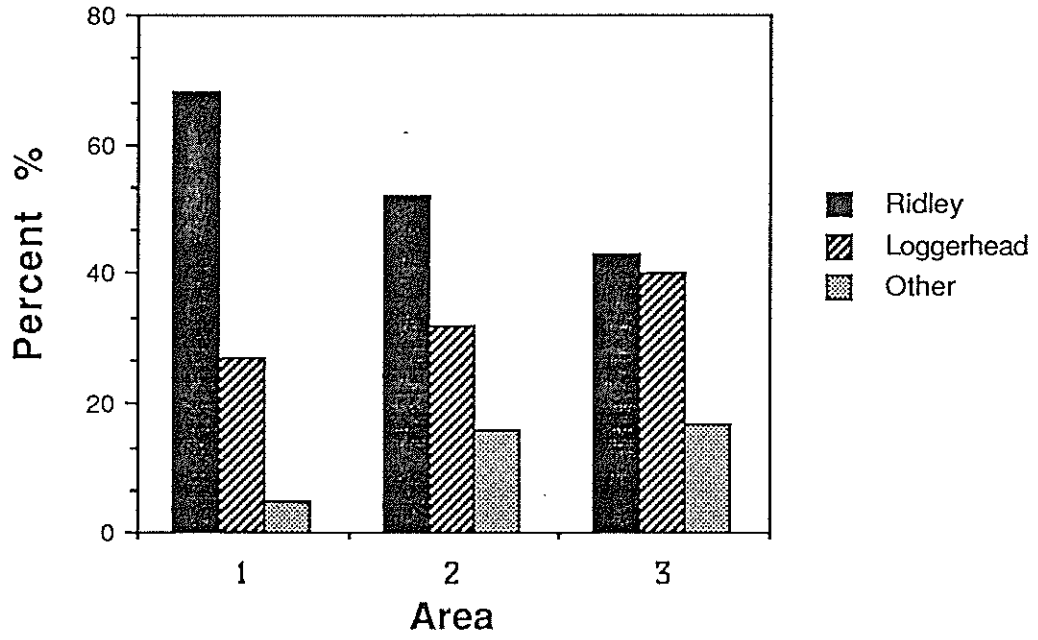

Figure 2. Percent composition of turtle strandings from all areas from 1986-89.

double rig gulf trawler, Capt. Bud, on a number of expeditions to this area.

Expeditions were not conducted on a regularly scheduled basis, but coincided with his regular trawling activities, except that special efforts were made to trawl in areas where he had captured animals in the past. Typically we were contacted via marine radio when the Capt. Bud was working in the area around Point au Fer and we would rendezvous in a small outboard boat. Because of the long distances between protected water and Point au Fer, weather was a complicating factor. A number of attempts to reach Point au Fer by small boat were thwarted by rough seas.

The Capt. Bud is a typical wooden Gulf trawler rigged with double 56 ft semi-balloon trawls deployed from outriggers mounted outboard.

Two cruises have been completed to date. On each the length and location of each trawl was recorded. Water temperature, salinity, and dissolved oxygen at the surface and near the bottom were recorded at the beginning and end of each day using a YSI Model 57 oxygen meter and a YSI Model 33 conductivity meter. (Due to an equipment malfunction hydrographic data was not recorded on the first cruise.) The contents of each trawl was subsamlped and the animals were counted and measured

Cruise 1

The first cruise began at 1400 on 20 July 1988 at approximately $91^{0}24.00'$ W $29^{0}19.50'$N or about 3 nautical miles west of Point Au Fer. Trawling was conducted at this location for the remainder of the day. A total of two trawl samples were made for a total time in the water of 6 hours and 20 minutes. Trawling was terminated at 2040 that evening.

The trawl was redeployed at 0635 the next morning (21 July 1988) and retrieved at 0940. Due to inclimate weather conditions the cruise was terminated after the first trawl of the day was brought on board.

Each trawl was subsampled with a 5 gallon bucket the full contents of which were identified to species, counted and average total lengths calculated on the basis of representative subsamples. The results from both cruises is represented in Table 1.

Our overall mission and the fact that we were interested in sea turtles was concealed from the rest of the fleet operating in this area. This was necessary because of the shrimp fleet's hostile feeling toward sea turtle preservation generated in the after math of planned TED regulations. Also the possibility of shrimpers conveying information about turtles they had caught over the radio was increased by my not being identified.

Table 1.: Total number and average size of all individuals collected from subsamples taken from trawls on Cruise 2.

Species	TRAWL 1	TRAWL 2	TRAWL 3	TRAWL 4	AVE.#/TRAWL (Rounded to the nearest whole#
			Total/Ave.Size t.l.(cm)		
20 July 1988 (5 gal. sample size)					
Blue Crab					
<5 cm	40	30			35
>5 cm	4	8			6
Menhaden	202/10.5	118/12.4			160
Croaker	160/12.0	138/10.8			149
Sand Trout	10/11.9	20/10.5			15
Spot	6/13.2	0			3
Hogchoker	2/7.7	0			1
Gafftop	20/9.2	0			10
Anchovy	22/5.4	0			11
Br. Shrimp	66/12.2	216/11.9			141
Wh. Shrimp	0	56/15.2			28
21 July 1988 (5 gal. sample size)					
Blue Crab					
<5 cm	40				20
>5 cm	16				8
Menhaden	74/10.8				37
Croaker	46/13.2				23
Sand Trout	68/12.4				34
Gafftop	20/8.5				10
Hardhead	2/11.4				1
Threadfin Shad	2/10.6				1
Fr. Flounder	6/7.4				3
Wh. Shrimp	130/9				65
Br. Shrimp	140/13				70
5 December 1988 (3 gal. sample size)					
Bkue Crab					
<5 cm	0	10			5
>5 cm	3	23			13
Menhaden	3/12.8	31/10.8			17
Sand Trout	9/11.4	24/7.5	Trawl discarded		17

Anchovy	9/6.2	23/6.8	|		16
Croaker	0	1/15	|		1
Fr.Flounder	0	0	|		0
Hogchoker	0	3/8.0	|		2
Hardhead	0	24/9.4	|		12
Tonguefish	0	2/9.0	|		1
Threadfin Shad	2/12.5	2/13.5	|		2
Sea Robin	2/13	2/9.0	|		2
Silver Perch	6/8.6	21/7.7	|		14
Harvestfish	1/7.2	2/5.5	Trawl discarded		2
At. Moonfish	1/9	0	|		1
Cutlassfish	0	1/20.0	|		1
Skilletfish	0	1/3.1	|		1
Wh. Shrimp	257/11.4	316/11.6	|		287
Sea Bob	148/4.3	459/4.2	|		304
Mantis Shrimp	10/6.5	3/6.1	|		7
Bay Squid	15/6.4	0			8

6 December 1988 (3 gal. sample size)

Blue Crab			4	|	
<5 cm	5	|	0	|	5
>5 cm	0	|	5/11.2	|	0
Menhaden	35/9.1	|	3/13.0	|	20
Sand Trout	11/10.1	|	22/6.9	|	7
Anchovy	36/7.0		0	Trawl discarded	29
Fr Flounder	1/9.5	Trawl not	9/8.7	|	1
Hardhead	12/4.8	sampled	79/9.6	|	11
Wh. Shrimp	92/10.3	|	785/9.3	|	86
Sea Bob	970/4.8	|	4/9.4	|	878
Mantis Shrimp	1/8.0	|	4/5	|	3
Bay Squid	1/2.5	|			3

7 December 1988 (3 gal. sample size)

Blue Crab				
<5 cm	15	2		9
>5 cm	2	0		1
Menhaden	12/10.6	4/6.4		8
Anchovy	33/7.2	116/4.3		75
Sand Trout	12/10.3	4/12.9		8
Hardhead	64/10.4	2/6.2		33
Silver Perch	48/9.8	14/10.4		31
Tonguefish	4/4.8	0		2
Fr. Flounder	3/6.4	0		2
Whiting	1/21.0	0		1
Cutlassfish	1/32.7	0		1

Wh Shrimp	20/9.9	48/6.3	34
Sea Bob	744/4.7	518/7.3	631
Mantis Shrimp	3/7.3	3/6.2	3

There was considerable interest about our activities and a number of the boat captains inquired about the 22' aluminum boat used to rendezvous with the Capt. Bud. (All markings identifying the aluminum boat as a state vessel had been removed.) In general though there was little conversation over the radio about TED's or turtles and there were no reports of boats having caught turtles during the trip.

Cruise 2

Cruise 2 was conducted on 5-7 December 1988. Cruise tracts for the three day period were recorded on a new LORAN-C/plotter that had been installed on the boat about one month earlier. Cruise tracts for the trawls conducted on this cruise are represented in Figure 3. Cruise tracts for trawl 2 day 2 were lost due to a malfunction in the plotter and trawl 4 on day 2 was not plotted because it was terminated after only 45 minutes.

A total of nine trawls were monitored on this trip resulting in 22 hours of trawling time. Two trawls were discarded because of presence of large balls of "seaweed" . According to Mr. Luke this was the first time he had experienced seaweed in quantities large enough to require the disposal of the entire contents of trawls. It was present in all nine of the trawls on this trip and appeared to be new growth an not material that had washed in from other locations. Samples were taken back to the lab and

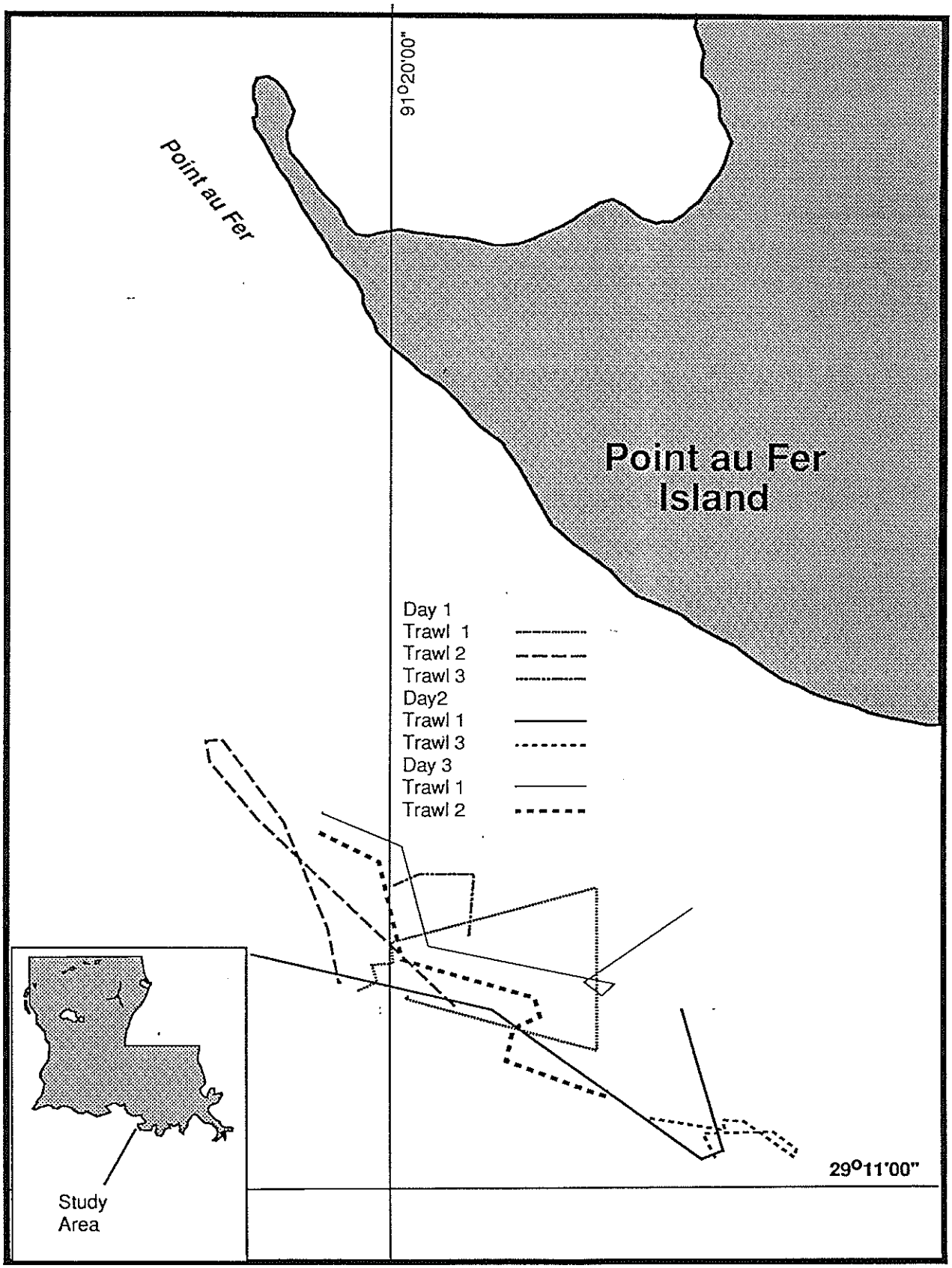

Figure 3. Cruise tracts of trawls from Cruise 2

identified as a colonial cnidaria of unknown genus and species.

The contents of each trawl except the two that were discarded and one that was taken when I was conducting a beach survey were subsampled using a 2 gallon bucket and the contents were recorded as during the first cruise. Water temperatures at the surface ranged from 16-17^{0}C and 14-17^{0}C on the bottom. The lowest salinity encountered was 17.5 ppt. in the surface water on the first day and averaged 24.5 ppt. at the bottom during the entire cruise. The water column was well mixed with regard to dissolved oxygen and there were no areas of anoxia found. The lowest reading was 5.6 ml/l on the second day. Winds were south-southwest 5-10 mph and the water was very turbid during the three day period.

From 25-40 working trawl boats were always visible. A partial list of the vessels observed trawling in the vicinity of the Capt. Bud and their home ports when identifiable are listed in Table 2. Mr. Luke was familiar with most of the boats encountered and communicated with most of these vessels at some point during the cruise. As before we did not disclose our mission. Very little mention of sea turtles or TED's was made nor were there any reports of recent sea turtle captures.

A short survey of the beach from east of Point Au Fer 91^{0}12.40 W 29^{0}19.30 N to an area west of Locust Bayou 91^{0}19.20 W 29^{0}17.00N and about 1/4 mile either side of

Table 2. Vessels observed working in the area around Point au Fer during Cruise 2.

Vessel	Homeport
Master Shawn	Dularge
C'est Lavie	Dulac
Capt. Jimmie	Dulac
Mark and Dawn	?
Only Son	Golden Meadow
Bobby Joe	Cut Off
Native Dancer	Dulac
Zydeco Man	?
Lady Lil	?
Seafood II	Dulac
Double D	Dulac
Mister Jude	Dulac
Misti Rae	Dularge
Carisma	Dulac
Mr. Catfish	Dulac
Mom Dad	Dulac
Grand Clotel	Golden Meadow
Janice	Dulac
Miss Rochelle	Little Caillou
Glenn Daryl	Dulac
Lady Shirley	Dulac
Mr. Rishoun	Dulac
Luna Sea	?
Lucille	?
Beach Comber	Montegut ?
Night Wing	Dulac
Mister Perry	Dulac
Deena Lynn	Biloxi
Oh Daralyn	?
Capt. Joey	New Orleans
Pumpkin Patch	Dulac
Golden Text	Dulac
F&S	?
Bayou Blue Baby	Dulac
Mookie & the Bandit	Dulac
Justin B	Dulac
Lady Liola	Cut Off
Queen City	Dulac
Lady Eula	?

Oyster Bayou was conducted on 6 December. The beach in both of these areas was severely eroded and devoid of flotsam.

Discussion

The presence of sea turtle in Louisiana is confirmed through the stranding data collected over the three year period. The number of strandings is relatively small compared to the number of stranding in other region of the Gulf of Mexico (Texas). This , however, does not suggest that sea turtles are less abundant in Louisiana. A number of factors, other than the relative abundance of live turtles in this area may contribute to the number of reported turtle strandings.

The coast of Louisiana is for the most part uninhabited and human activity on the limited number of beaches is low. Consequently, a large percentage of the turtle strandings may go unreported. Also, a large portion of the coastline is covered by tall marsh grass, which obscures stranded animals.

The predominant longshore currents and absence of strong offshore winds in this region of the Gulf of Mexico may also contribute to the low number of strandings by transporting dead turtles away from the coast.

Also, in the past, some of the turtle caught by Louisiana shrimpers that would eventually appear as

strandings in other regions were instead being eaten. Since the introduction of TEDs and the controversy surrounding them this is probably no longer the case. But, local shrimpers are aware that stranded animals confirm the existence of turtles in Louisiana; a fact that they would rather not be substantiated. This, in turn may precipitate the total destruction of some turtles caught in trawls.

Stranding data does indicate an interesting trend in the species composition of sea turtle populations in Louisiana. Kemp's ridleys are the dominant species along the entire coast and are most prevalent in the Western part of the state. Loggerheads on the other hand are more abundant on the eastern side of the Mississippi River Delta.

Studying stranded animals, although necessary, is a very restrictive method for learning the biology of any marine organism. The limitations presented by the remoteness of the Louisiana coast also contribute to utility of this method. A well rounded approach to understanding the biology of sea turtles must included efforts to define the natural limits of sea turtles habitat in Louisiana.

In the past all of the information gathered from the trawl fleet suggested that turtles were most abundant during periods when blue crabs were abundant. This was usually during the late summer when low dissolved oxygen measurements were recorded in the bottom waters off Oyster Bayou. This anoxic bottom water may have concentrated the ridleys favorite food species, blue crabs, in shallow

coastal waters where trawling activity was the highest. Turtles may follow the crabs into these areas and thereby become more susceptible to capture .

The absence of turtles during the first two trawl trips to Oyster Bayou may be explained by the low numbers of blue crabs during this period. A mixed water column and oxygenated bottom waters in the area may have contributed to the reduced number of blue crabs captured in the trawl. Unfortunately, the low dissolved oxygen phenomena is very unpredictable. It is though, more prevalent in the late summer and for that reason future collecting expedition will be limited to these months.

There is no question that sea turtles in this area are encountered more often by trawlers than by any other group. Every effort should be made to tap this potential source of information. The present study is an attempt to accomplish this not only by collecting data during isolated trips aboard trawlers, but by reestablishing the trust that allowed a free flow of information in the past.

Literature Cited

Dobie,J.L., L.H. Ogden, and J.F. Fitzpatrick, Jr. 1961. Food notes and records of the Atlantic ridley turtle (Lepidochelys kempi) from Louisiana. Copeia 1961(1):109-110.

Ehrhart, L.M. 1977. A continuation of base-line studies for environmental monitoring space transportion systems at John F. Kennedy Space Center. Annual report to NASA.

Hildebrand, H. 1981. A historical review of the status of sea turtle populations in the western Gulf of Mexicp In K. A. Bjorndal (ed) Biology and conservation of sea turtles. Smithsonian Institution Press, Washington,D.C. pp.447-453.

Liner,E.A. 1954. The herpetofauna of Lafayette, Terrebonne, and Vermilion parishes, Louisiana. Louisiana Acad. Sci. 17:65-85.

Pritchard, P.C.H. and R. Marquez.1970. Kemp's ridley turtle or Atlantic ridley, Lepidochelys kempi. Monges, Switzerland: IUCN mongraph.

Sothern, James M. 1980. Last Island. Cheri Pulications Houma, Louisiana. pp.80.